CLAIMS

What is claimed is:

1. An optical system for a projection display apparatus, comprising:

a light source which provides a light beam;

a light valve which receives and reflects the light beam of said light source;

a projection lens which is arranged in the optical path of the reflection light of said light valve; and

a prism which is arranged among said light source, said light valve, and said lens, said prism having a total internal reflection surface which the light beam passes through directly to impinge onto said light valve and total reflects by said light valve to said projection lens.

2. An optical system according to claim 1, wherein said prism is a straight pillar prism.

3. An optical system according to claim 1, wherein said prism is a triangle pillar prism.

4. An optical system according to claim 1, wherein said light source, said light valve, and said projection lens are, respectively, adjacent to different surface of said prism.

5. An optical system according to claim 1, wherein the four edges of said light valve are each parallel to the four edges of the surface of said prism in which the surface is opposite to said light valve.

6. An optical system according to claim 1, wherein a lens is arranged between said total internal reflection surface and said light source.

7. An optical system according to claim 6, wherein said lens is an asymmetric lens.

8. An optical system according to claim 1, wherein a auxiliary prism is arranged between said total internal reflection surface and said light source, which the auxiliary prism is straight pillar shape with a space apart to said total internal reflection surface.

9. An optical system according to claim 8, wherein said auxiliary prism has a reflection surface to reflect the light beam, which emits from said light source, enters said auxiliary prism, and impinges to said reflection surface with an incidental angle larger than the critical total reflection angle, through said prism to impinge into said light valve.

10. An optical system according to claim 8, wherein said auxiliary prism has a reflection surface, which said light beam from said light source enters said prism, is reflected by said total internal reflection surface of said prism, impinges to said light valve, then, reflects through said prism into said auxiliary prism, impinges with an incidental angle larger than the critical total reflection angle into said reflection surface of said auxiliary prism, and impinges into said projection lens by total reflection of said reflection surface.